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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,594	09/05/2003	Aboelmagd Noureldin	45074.17	7321

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EXAMINER	
SMITH, RICHARD A	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 05/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/655,594	NOURELDIN ET AL.	
	Examiner	Art Unit	
	R. Alexander Smith	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-3 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-3 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 05 September 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Drawings

1. The drawings are objected to because:

a. Figure 3 has overlapped typing of the words "Earth" and "mass".

b. The boxes labeled 22 and 20 in Figure 7 should be labeled as --transmitter 22-- and --microprocessor 20-- respectively.

Correction is required.

Specification

2. The specification is objected to because of the following informality: On page 1, the cross-reference to Application Number 09/790,591 should also include --now U.S. Patent No. 6,668,465--.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible

harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-3 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 6,668,465 in view of U.S. 4,542,647 to Molnar.

U.S. 6,668,465 discloses a method wherein the method includes a continuous measurement while drilling surveying apparatus for surveying the drilling progress of a bottom hole assembly (BHA) having a tool-pin axis and defining a central drilling fluid passage, said apparatus comprising a fiber optic gyroscope within or adjacent the BHA which encircles the drilling fluid passage, the gyroscope having its sensitive axis aligned with the tool-spin axis; a second gyroscope mounted within or adjacent to the BHA and having its sensitive axis normal to the

tool-spin axis, accelerometer means for generating three acceleration signals representing the components of acceleration of the BHA along three mutually orthogonal axes; and means for determining the angle of the BHA away from the vertical; and the use of a Kalman filter for estimating error and correcting inertial output.

U.S. 6,668,465 does not disclose first processing means for receiving the output of the gyroscope and producing a first signal representative of the angular velocity of the BHA about the tool-spin axis, wherein the first processing means includes means for receiving the output of the second gyroscope and producing a second signal representative of the angular velocity of the BHA about an axis normal to the tool-spin axis; accelerometer processing means responsive to the acceleration signals for determining the angle of the BHA away from the vertical and for generating a third angular rotation signal representing rotation of the BHA about an axis normal to the sensitive axes of the first and second gyroscopes; second processing means responsive to the first, second and third angular rotation signals and the acceleration signals for transforming signals representing movement of the BHA in a BHA coordinate system to a earth local-level coordinate system, and third processing means operatively connected to the second processing means for determining the orientation of the BHA, determining the velocity changes of the BHA, updating the velocity components of the BHA and updating the position components of the BHA; and the Kalman filter being operatively connected to the third processing means.

Molnar discloses a borehole survey apparatus employing two ring laser gyro's, three accelerometers and accelerometer processing means responsive to the acceleration signals for determining the angle of the apparatus away from the vertical and for generating a third angular

rotation signal representing rotation of the apparatus about an axis normal to the sensitive axes of the first and second gyroscopes (while moving and while not moving; column 1, lines 60-68).

Molnar discloses first processing means (56 at 66) for receiving the output of the gyroscope and producing a first signal representative of the angular velocity of the apparatus about an axis normal to the tool-spin axis, wherein the first processing means includes means for receiving the output of the second gyroscope and producing a second signal (58 at 66) representative of the angular velocity of the apparatus about the other axis normal to the tool-spin axis; accelerometer processing means (column 5, lines 34-64) responsive to the acceleration signals for determining the angle of the apparatus away from the vertical and for generating a third angular rotation signal (80) representing rotation of the apparatus about an axis normal to the sensitive axes of the first and second gyroscopes (abstract, in this case the generated third angular rotation signal is along the tool-spin axis); second processing means responsive to the first, second and third angular rotation signals and the acceleration signals for transforming signals representing movement of the apparatus in an apparatus coordinate system to a earth local-level coordinate system (column 6, lines 1-18), and third processing means operatively connected to the second processing means for determining the orientation of the apparatus, determining the velocity changes of the apparatus, updating the velocity components of the apparatus and updating the position components of the apparatus (column 6, lines 19-66), and a Kalman filter being operatively connected to the third processing means (columns 7-9).

Therefore, it would have been obvious to one of ordinary skill to add processing means and Kalman filter, as suggested by Molnar, to the apparatus, taught by U.S. 6,668,465, in order to provide the necessary conversions of the two gyro's and the three accelerometers into the

location, position and movement of the apparatus in an earth based coordinate system, as taught by Molnar, and to help reduce signal errors and noise which will adversely affect the accuracy.

With respect to the two gyro's generating the third angular rotation signal along the tool spin axis, as taught by Molnar, versus along one of the normal axes, as claimed: the use of two gyro's and three accelerometers when the generation of the synthetic signal is along one of the normal axes, as claimed by Applicant, is considered to be equivalent to use of the two gyro's and three accelerometers when the generation of the synthetic signal is along the tool spin, as disclosed by Molnar, since: 1) neither non-obvious nor unexpected results, i.e., results which are different in kind and not in degree from the results of the prior art, will be obtained if one is used instead of the other, as long as all three required angular rotations are provided to the processing means so that the processing means can perform the calculations, as already taught by Molnar.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. The prior art cited in PTO-892 and not mentioned above disclose related apparatus.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. Alexander Smith whose telephone number is 571-272-2251. The examiner can normally be reached on Monday through Friday from 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. Alexander Smith
Examiner
Technology Center 2800

RAS
May 12, 2004